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## **Priming in economics**

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## **Priming in Economics**

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# Priming in Economics

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## Abstract

Conceptual priming has become an increasingly popular tool in economics. Here, we review the literature that uses priming in incentivized experiments to study economic questions. We mainly focus on the role of social identity, culture, and norms in shaping preferences and behavior. We also discuss recently raised objections to priming research and conclude with promising avenues for future research.

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## Introduction

Most research in economics is based on the assumption that preferences are stable across time and context [1]. Therefore, changes in behavior are thought to be driven primarily by changes in incentives, beliefs, and constraints. A more recent literature on endogenous preferences challenges this assumption and argues that preferences can also be shaped in important ways by the economic and social environment [2–4].

To measure the causal effects of the environment on preferences and behavior, economists have recently turned to priming techniques from experimental psychology. Priming refers to the activation of mental concepts through subtle situational cues [5], which can be used to measure the psychological impact of primed concepts on judgment and behavior in subsequent tasks. Typical priming techniques include actively prompting subjects to think about specific concepts [6] or recollect past experiences [7]. More implicit approaches include the unscrambling of sentences [8], background music and images [9,10], odors [11], temperature [12], and subliminal stimuli [13,14].

Here, we report recent priming studies, with a focus on one of the most prominent applications of priming within economics: the influence of social identity, culture, and norms

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on preferences and behavior. We limit ourselves to “economic” experiments, i.e., experiments where subjects’ decisions are financially incentivized.<sup>2</sup> Priming in incentivized experiments has also been used to render other concepts salient, such as money [10,15,16], markets and competition [17–19], intuitive reasoning [18,20,21], morality [14,22], and observability [23–27]. We further discuss recent concerns related to priming research and lay out avenues for future research.

### **Priming social identity, norms, and culture**

Akerlof and Kranton [28] introduced the concept of identity into economic theorizing. Inspired by self-categorization theory from social psychology [29], they developed a model of how an individual’s identity, or sense of belonging to a social group, can influence behavior and economic outcomes. They proposed that individuals have multiple identities (e.g., based on their gender, ethnicity, or occupation) that are tied to identity-specific norms that prescribe how people should behave in particular situations. Identity concerns are thought to affect behavior because deviating from the prescribed behavior (i.e., norms) is psychologically costly.

Identifying the causal impact of identity and norms on behavior is empirically challenging using traditional empirical approaches. Imagine, for example, that you wish to test whether religious affiliation influences prosocial behavior. Simply comparing prosocial behavior between individuals of different religions can be misleading for at least two reasons. First, different religious groups might attract people with different prosocial inclinations, making it difficult to isolate identity and norms from non-random selection to religious groups. Second, there could be a third unknown variable that correlates with both religious identity and prosocial behavior.

By experimentally manipulating the saliency of identity within a specific social group, priming allows to circumvent the aforementioned issues of selection bias and third variables. The key identifying assumption is that priming changes the relative weight individuals attach to a specific identity (and its associated norms) at a given moment. Random assignment ensures that there are no observable and unobservable differences between the priming conditions. Consequently, any behavioral difference between conditions reveals the primed identity’s marginal behavioral effect.

Benjamin et al. [30] were among the first economists adopting this approach to analyze the effects of ethnic, racial, and gender identity norms on time and risk preferences. Their results show that – consistent with commonly-held ethnic stereotypes – participants primed with their Asian-American identity were more patient than participants not primed by this identity. By contrast, priming one’s racial identity for African-American participants or gender identity priming had no significant influence on risk and time preferences.<sup>3</sup>

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<sup>2</sup> As economist, we are mainly interested in the effects of priming on behavior rather than on judgment and attitudes.

<sup>3</sup> The results from [31] and [32] suggest that gender/family identity priming can influence altruistic and competitive preferences.

Using a similar approach, Chen et al. [33] found stronger in-group favoritism in a cooperation task for primed Asian-American students relative to non-primed students. However, a similar identity priming did not affect in-group favoritism for Caucasian students. Berge et al. [34] also studied the effect of ethnic identity priming on parochialism in Kenya. Surprisingly, they found no indication of ethnic biases in either priming or control conditions.

Cohn et al. [35] examined how a considerably different social identity – a prisoner’s criminal identity – affects rule violating behavior. Inmates from a maximum security prison were instructed to toss coins in private and report their outcomes. Prisoners only received financial rewards when reporting “heads,” and thus had an incentive to misreport their outcomes for unsuccessful coin flips. When prisoners were primed with their criminal identity, they were significantly more likely to cheat on this task compared to inmates from the control group. They performed a manipulation check in a follow-up experiment in the same prison and found that the criminal identity priming enhanced the mental accessibility of crime-related thoughts. Finally, a placebo experiment highlights that regular citizens did not cheat more in response to crime-related reminders, suggesting that the priming effect was specific to individuals who already possessed a criminal identity.

Cohn et al. [36] extended the approach to study unethical conduct in the banking industry. Recent and widely-publicized scandals within the banking industry (e.g., manipulations of key interest and foreign exchange rates) have often been attributed to a problematic business culture – i.e., the norms and informal rules that dictate appropriate behavior. To test whether the business culture within the banking industry favors (or at least tolerates) dishonest behavior, they primed bank employees with their professional identity and associated norms. Subsequently, Cohn et al. measured the bank employees’ dishonesty using a similar coin tossing task as in [35]. Reminding bank employees of their professional identity increased cheating compared to a control group. Follow-up experiments also found that the priming effect was specific to bank employees, because employees from various other industries and students did not cheat reliably more when primed with their professional identity or with bank-related concepts. Together, the results support the hypothesis that cultural norms of the banking industry contribute to fraudulent behavior.

It is interesting to contrast the previous results with that of Cohn et al. [37], who primed bank employees with their professional identity and then measured their willingness to take financial risks. There, Cohn et al. found that priming bankers with their professional identity *increased* risk aversion — a finding at odds with widespread concerns that banking culture promotes risk taking. While the business culture within the banking industry appears to be problematic with regards to ethical conduct, it does not seem to promote excessive risk taking.

Due to the growing interest in the relationship between religion, culture, and economic outcomes [38,39], researchers have begun to examine the downstream effects of religious identity primes on a variety of economic behavior. For example, Benjamin et al. [40] show that primed Protestants increase voluntary contributions in a public goods game, whereas primed Catholics decrease their contributions. By contrast, these same studies found no priming effects on work effort, temporal discounting, and altruistic giving.

Shariff and Norenzayan [41] examined the impact of general religious concepts on altruism. They show that religious primes increased altruistic giving relative to neutral primes or no prime at all.<sup>4</sup> However, the religious primes affected theists and atheists equally,<sup>5</sup> and a secular prime that reminded subjects of moral institutions (e.g., courts of law) resulted in a similar increase in prosocial behavior. These results raise the possibility that religious primes could operate through a channel other than religious identity, such as making concepts of morality more salient (see also [46]). By contrast, McKay et al [13] found that religious primes promote altruistic punishment of unfair behavior, but only in subjects who had previously donated money to a religious organization.

One common thread running through the aforementioned studies is that the behavioral response to the primed identity reveals information about the norms associated with that identity. However, these studies did not directly measure the impact of identity salience on perceived norms. Chang et al. [47] provide evidence that identity norms mediate the influence of priming on behavior in the context of political identity and redistribution.

Besides examining economic behavior, priming has also been used to study the impact of social identity on cognitive skills. Hoff and Pandey [48] primed the social status of Indian students by making their caste affiliation publicly known and subsequently measured their performance in an incentivized cognitive task. They found that making one's caste identity salient impeded the learning of low-caste students when interacting in a mixed-caste group, relative to both segregated groups and a control condition where participants' caste was kept private. Afridi et al. [49] found similar results with Chinese students. In their study, low status students (i.e., rural migrants) performed significantly worse in an incentivized cognitive task when their social status was made public. Dee [50] examined cognitive impairment implied by the student-athlete identity as another type of negatively stereotyped identity. In that study, identity priming reduced the cognitive performance of athletes relative to non-athletes. Together, these results are consistent with a large literature in psychology on stereotype threats (e.g., [51,52]). However, Fryer et al. [53] could not replicate the negative effect of gender stereotype on math performance, irrespective of whether task performance was incentivized or not.

### **Concerns about priming research**

In recent years, priming research has been the target of considerable criticism due to failed replications of several prominent priming studies [54]. While this criticism should be taken seriously, problems with replication have been observed throughout psychological research [55] and other sciences [56], including economics [57]. In our view, independent replication is crucial. On the one hand, this requires a greater willingness of the top scientific journals to publish replication studies, irrespective of whether the original findings are confirmed or

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<sup>4</sup> See also [42] and [43] for evidence that religious priming effects can also generalize to Muslim subjects.

<sup>5</sup> [44] and [45] also found that religious primes increase prosocial behavior and honesty irrespective of participants' religiosity.

disproved. On the other hand, researchers should, in addition to disclose original data and codes, provide all materials necessary for independent replication [58].

Another concern, often raised by economists, is whether priming effects are in fact working through the proposed mechanisms. In many cases, pinning down exactly which mental concept has been activated by a particular prime has proven elusive and challenging, making it difficult to definitively establish the exact cause of a behavioral change. Additional experiments with control conditions or conceptually similar primes, along with direct manipulation checks, can mitigate this problem and help researchers to rule out alternative explanations. Note that most other empirical approaches share a similar weakness. For example, causality is difficult to establish with non-experimental data because it is rarely possible to take into account all confounding factors. Thus, at the end of the day, the reader is left, to some degree, with introspection about a given mechanism's plausibility and a set of robustness checks against alternative hypotheses. Yet, most scholars would probably agree that non-experimental studies have contributed significantly to scientific progress.<sup>6</sup>

### **The future of priming research in economics**

We believe that one fertile area for future priming research is the investigation of economic and social phenomena where large-scale field experimentation would be (i) prohibitively costly, (ii) ethically unacceptable, or (iii) simply impossible to administer or manipulate exogenously. For instance, economists have become increasingly interested in the effects of war and civil conflicts — an area of research that does not readily lend itself to direct experimentation [59]. To learn about the consequences of traumatic and violent experiences on economic preferences, Callen et al [7] conducted a priming experiment in Afghanistan with civilians from different regions. They asked participants to describe a fearful experience (e.g., a bomb explosion) and then elicited their willingness to take risks using hypothetical lottery choices. The recollection of fearful experiences, relative to happy or neutral recall episodes, increased individuals' preference for certainty, an effect that was especially pronounced for those living in regions that recently suffered violent attacks.

Macroeconomics and finance are other fields where priming techniques can open up new opportunities to identify causal effects. Macroeconomic trends and policies affect the economy at large, which makes it challenging to construct proper counterfactuals [60]. Experimental priming allows researchers to examine the psychological impact of specific macroeconomic variables (e.g., economic growth, inflation, and unemployment) while holding constant the host of other fundamental factors that naturally covary with these variables. For example, Cohn et al. [6] ran a priming experiment to examine the influence of financial market trends on risk preferences. They primed financial professionals to think about a stock market boom or bust and then measured their degree of risk aversion in a simple investment task with high financial stakes. They found that – consistent with a majority of modern asset pricing models [61] – participants exposed to financial “busts” were more risk averse relative to participants exposed to financial “booms.”

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<sup>6</sup> We thank James Choi for pointing out this analogy.

These two examples illustrate how priming can provide novel empirical strategies that complement more traditional econometric techniques like instrumental variables, regression discontinuity, and naturalistically occurring quasi-experiments.

Another promising avenue for future research are priming interventions in the field. For example, Kessler and Milkman [62] analyzed two direct mail field experiments carried out by the American Red Cross, aimed to solicit donations from donors who failed to make financial contributions in previous years. Both experiments reveal that priming prosocial identities (either as a previous donor to the charity or as a member of a local community) increased the likelihood of a donation.

This example suggests that priming can be a low-cost and effective tool for policy makers and organizations to promote desirable behavior. Future research should extend priming in naturally occurring environments to other policy-relevant domains, such as health [63], saving [64], voting [65], and tax payment [66]. However, priming people without their awareness and consent brings with it a host of thorny ethical issues, which are currently being vigorously debated [67]. Getting clarity on such ethical issues will only become more important and pressing as behavioral science plays an increasingly large role in informing the design of public policy.



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